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### RECORD OF REVISIONS

Rev	Date	Description	POC	OIC
0	8/16/04	Initial issue.	Kelly Bingham, <i>FWO-DECS</i>	Gurinder Grewal, <i>FWO-DO</i>

Contact the Welding Standards POC for upkeep, interpretation, and variance issues

<b>GWS 1-06</b>	<b>Welding POC/Committee</b> <a href="http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld">http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld</a>
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## **GWS 1-06 WELD JOINT DESIGN**

### **1.0 PURPOSE AND SCOPE**

- A. The purpose of this GWS is to provide weld joint design details for implementation of the LANL Welding Program in accordance with References 1 through 17.
- B. The scope of this GWS is welding activities performed by LANL, SSS personnel, and subcontractors.

### **2.0 REFERENCES**

- 1. WFP 2-31, Welding Fabrication Procedure for AWS D1.1 Structural Welding
- 2. WFP 2-32, Welding Fabrication Procedure for AWS D1.3 and AWS D9.1 Sheet Metal Welding
- 3. WFP 2-33, Welding Fabrication Procedure for AWS D1.2 Structural Aluminum
- 4. WFP 2-34, Welding Fabrication Procedure for AWS D1.6 Stainless Steel
- 5. WFP 2-11, Welding Fabrication Procedure for ASME B31.1 Power Piping
- 6. WFP 2-12, Welding Procedure for ASME B31.3 Process Piping
- 7. WFP 2-13, Welding Procedure for ASME B31.8 Gas Transmission and Distribution Piping Systems
- 8. WFP 2-14, Welding Fabrication Procedure for ASME B31.9 Building Services Piping
- 9. WFP 2-15, Welding Fabrication Procedure for ASME Section I Power Boilers
- 10. WFP 2-16, Welding Fabrication Procedure for ASME Section III Nuclear Components
- 11. WFP 2-17, Welding Fabrication Procedure for ASME Section VIII Pressure Vessels
- 12. WFP 2-21, Welding Fabrication Procedure for API 650 Oil Storage Tanks
- 13. WFP 2-22, Welding Fabrication Procedure for API 1104 Welding of Pipelines and Related Facilities
- 14. WFP 2-23, Welding Fabrication Procedure for API 653 Tanks
- 15. WFP 2-41, Welding Fabrication Procedure for AWWA D100 Water Storage Tanks
- 16. WFP 2-51, Welding Fabrication Procedure for Non-Code Applications
- 17. WFP 2-61, Welding Fabrication Procedure for DOE Nuclear Applications

### **3.0 ACRONYMS AND DEFINITIONS**

None.

## **4.0 GENERAL**

### **4.1 Responsibilities**

- A. The assigned **LANL Facility, Project, or Program Manager** or qualified designee is responsible for applying weld joint design criteria in accordance with this Section and the Welding Fabrication Procedure for the applicable fabrication / construction code as defined in the Reference section.

## **5.0 PROCEDURE**

- A. The responsible LANL Facility / Project / Program Manager (or qualified designee, e.g. Engineer, Technician, CWI, or Supervisor) shall apply the appropriate weld joint design (from Attachment 1 or 2 where applicable) for each weldment in accordance with engineering requirements, the fabrication or construction code Welding Fabrication Procedure (WFP), and selected Welding Technique Sheet (WTS).
  - 1. Attachment 1 provides pre-qualified weld joint designs to be applied for welding to AWS requirements in accordance with References 1 through 4.
  - 2. The weld joint details contained in Attachment 2 are provided for application in welding to ASME, API, and AWWA codes. See References 5 through 15. Joint details in Attachment 2 are also to be used for welding to non-code and general nuclear code procedures in accordance with References 16 and 17.
- B. Weld joint designs shown in Attachments 1 and 2 are not necessarily inclusive of those found on a project. Alternative joint designs provided may be used. Weld joint designs referenced in an approved engineering specification or design drawing will take precedence over the configurations shown or referenced by this section. Weld joint designs not covered by approved engineering documents or Attachments 1 and 2 shall be referred to the LANL WPA for resolution.
- C. Pipe end preparation details illustrated in Attachments 1, 2, and 3 shall be used in conjunction with the applicable Welding fabrication / construction code and Welding Fabrication procedure (WFP).
- D. Weld joint bevels may be changed to V, J, or U bevels or a combination of these bevels as necessary and approved. Bevel angles for V joints shall be  $37\ 1/2^\circ \pm 15^\circ$ . For groove welds in materials greater than 1/4 in. thickness, the bevel shall not be less than  $10^\circ +5^\circ/-0^\circ$  on at least one side without acceptance of the LANL WPA.
- E. Weld layer details in Attachment 3 are illustrative only and the number of weld passes and deposit sequence may vary depending upon thickness, type of material, fit-up, and welding technique.

## **6.0 ATTACHMENTS**

Attachment 1: AWS Weld Joint Designs

Attachment 2: Weld Joint Designs for ASME, API, AWWA, and Non-Code

Attachment 3: Weld Layer Details (Typical)

Attachment 4: Pipe End Prep Details